

Application Number 10/522,030
Amendment dated June 18, 2008
Response to Office Action mailed March 18, 2008

REMARKS

This Amendment is responsive to the Office Action dated March 18, 2008. Applicant has amended claims 1–11 and canceled claims 12–32. Claims 1–11 are pending.

In view of the above amendments and the following remarks, Applicant respectfully requests reconsideration and withdrawal of the rejections set forth in the Office Action.

Objections to the Specification

In the Office Action, the specification was objected to because the abstract of the disclosure does not commence on a separate sheet in accordance with 37 C.F.R. 1.52(b). Applicant respectfully submits that the present application is a national filing under 37 U.S.C. 371 of International Application No. PCT/GB/2003/003176, filed July 25, 2003. As such, the international application filed under the PCT constitutes the U.S. application. The international application properly contained an abstract on a separate sheet. Applicant refers the Examiner to Published U.S. Patent Application 2005/0252235, which confirms that the abstract for the present application has been recognized and published properly. Applicant respectfully requests withdrawal of this objection.

The specification was also objected to for not containing any reference to the cited foreign priority documents within the first paragraph. In this Amendment, Applicant submits a new first paragraph, in which reference is made to the foreign priority documents.

In view of the above amendments, Applicant respectfully requests withdrawal of the Objections to the specification.

Claim Objections

In the Office Action, claims 2–11 were objected to for reciting “A sorption module.” In this Amendment, Applicant has amended each of claims 2–11 to recite “The sorption module,” as suggested in the Office Action. In view of the amendments to claims 2–11, Applicant requests withdrawal of the claim objections.

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Claim Rejection Under 35 U.S.C. §§ 102(b) and 103(a)

In the Office Action, claims 1-10 were rejected under 35 U.S.C. § 102(b) as being anticipated by Pfister et al. (U.S. Patent No. 6,415,627, hereafter Pfister). The Office Action rejected claim 11 under 35 U.S.C. § 103(a) as being unpatentable over Pfister. Applicant respectfully traverses the rejections to the extent such rejection may be considered applicable to the amended claims. Pfister fails to disclose each and every feature of the claimed invention, as required by 35 U.S.C. 102(b), and provides no teaching that would have suggested modification to include such features.

For example, Pfister fails to disclose or suggest a sorption module including a quantity of sorbate fluid and pressure within the module such that, when the sorbent material is saturated with adsorbed or absorbed sorbate and at its lowest anticipated operating temperature, the evaporator section is substantially filled with sorbate liquid, as recited by Applicant's claim 1. In other words, the sorption module includes sufficient sorbate fluid that when the sorbent material is filled to capacity with adsorbed or absorbed sorbate (i.e., saturated as stated in claim 1) and at its lowest anticipated operating temperature, there is enough sorbate fluid remaining to substantially fill the evaporator section with sorbate liquid, as recited in claim 1.

Pfister is generally directed to a sorber cooling device that may be used in an electromagnetic wave activated sorption system.¹ The sorption system includes a sorber 12, a condenser 38 a receiver or refrigerant reservoir 40 and an evaporator 42.² Pfister teaches, "The design of the condenser 38 is dependent upon the volume of the sorbate employed in the system, which in turn depends upon the temperature drop desired at the evaporator 42 and the specific sorbate and sorbent employed in the system, as will be described hereafter by way of example." Pfister also teaches, "The evaporator 42 is designed using conventional refrigeration techniques to have the capacity and configuration required to achieve a desired cooling effect."³ Based on these teachings in Pfister, the Office Action concluded that Pfister discloses that when the sorbent material is saturated with adsorbed sorbate and at its lowest anticipated operating

¹ Pfister, Abstract.

² Pfister, column 5, lines 43-50.

³ Pfister, column 6, lines 13-15.

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temperature, the evaporator is substantially filled with sorbate liquid, as required in Applicant's claim 1.

However, Pfister merely discloses that the evaporator is designed to have the capacity to achieve a desired cooling effect. Pfister proceeds to illustrate the design in three examples.⁴ For example, in Example 1, Pfister states that 3 kW of cooling is required to maintain an evaporator temperature of -50°C for 30 seconds.⁵ Using the change in enthalpy from liquid ammonia at 50°C to vapor ammonia at -50°C, which is about 1050 joules per gram, Pfister determines the required mass flow rate of ammonia to be about 2.86 grams per second.⁶ This 2.86 grams of ammonia per second is required for 30 seconds, so Pfister concludes, "[A] total of $2.86 \text{ g/s} \times 30 \text{ s} = 85.80$ grams of ammonia are required in the system."⁷ (Emphasis added) Thus, it is seen that the capacity and configuration of the evaporator that is required to achieve a desired cooling effect is designed based on evaporating all of the sorbate in the system.

Pfister then calculates the amount sorbent based on the required amount of sorbate. Specifically, Pfister calculates the amount of sorbent required to either absorb or adsorb all of the sorbate in the system.⁸ Pfister also states that additional sorbent may be used based on certain factors, such as the time required to dissipate the heat of adsorption.

This calculation, and similarly, the calculations presented in Examples 2 and 3 of Pfister, clearly indicate that the required cooling amount is accomplished by evaporating all of the sorbate from the evaporator. Pfister also teaches an amount of sorbent is used such that all of the sorbate is absorbed or adsorbed in the sorbent. Accordingly, at the time at which the sorbent material is saturated with adsorbed or absorbed sorbate and at its lowest anticipated operating temperature, it is expected that substantially no sorbate will remain in the evaporator. Clearly, Pfister fails to disclose or suggest a sorption module including a quantity of sorbate fluid and pressure within the module such that, when the sorbent material is saturated with adsorbed or absorbed sorbate and at its lowest anticipated operating temperature, the evaporator section is substantially filled with sorbate liquid, as recited by Applicant's claim 1.

⁴ Pfister, column 9, line 15 to column 12, line 46.

⁵ Pfister, column 9, lines 16–19.

⁶ Pfister, column 9, lines 34–40.

⁷ Pfister, column 9, lines 46–47.

⁸ See, e.g., Pfister, column 9, lines 47–57.

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Furthermore, Pfister fails to disclose or suggest a sorption module comprising a generator section connected via a first passage to a condenser section, where the condenser section is connected by a second passage to an evaporator section, as required by Applicant's claim 1.

In support of the rejection of claim 1, the Office Action characterized sorber 12, magnetron 16 and power circuit 18 of Pfister as a sorption module.⁹ The Office Action further characterized sorber 12 and magnetron 16 of Pfister as a generator section, condenser 38 as a condenser section, and evaporator 42 as an evaporator section.¹⁰

However, the Pfister disclosure describes the generator, condenser and evaporator as separate and interconnected units. This fact was apparently recognized by the Office Action in characterizing sorber 12, magnetron 16 and power circuit 18 of Pfister as the sorption module, to the exclusion of the condenser 38 and evaporator 42. In contrast, Applicant's claim 1 requires a sorption module that includes all of a generator section, a condenser section and an evaporator section. A module requires a unitary structure of the generator section, condenser section and evaporator section, which is neither disclosed nor suggested by Pfister. Accordingly, Pfister does not disclose or suggest a sorption module comprising a generator section connected via a first passage to a condenser section, where the condenser section is connected by a second passage to an evaporator section, as required by Applicant's claim 1.

Additionally, Pfister does not disclose or suggest that the generator, condenser and evaporator sections are so arranged or interlinked such that liquid in the condenser section is encouraged to flow to the evaporator section and discouraged from flowing to the generator section, as required by Applicant's claim 1. In contrast, Pfister requires check valves 44, 46 between the input/output line 36 and condenser 38 and evaporator 42 to control the flow of sorbate through the system.¹¹ These check valves 44, 46 are distinctly different from and do not anticipate or render obvious generator, condenser and evaporator sections arranged or interlinked such that liquid in the condenser section is encouraged to flow to the evaporator section and discouraged from flowing to the generator section, as required by Applicant's claim 1.

⁹ Office Action dated March 18, 2008, page 3, lines 3-4.

¹⁰ Office Action dated March 18, 2008, page 3, lines 4-10.

¹¹ Pfister, column 5, lines 50 - 53.

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Claims 2–11 depend from claim 1 and are in condition for allowance for at least the reasons presented above with respect to claim 1. In addition, the dependent claims introduce further limitations that are neither disclose nor suggested by Pfister.

For example, Pfister neither discloses nor suggests that the first and second passages comprise adiabatic sections, as required by Applicant's claim 3.

In support of the rejection of claim 3, the Office Action characterized input/output line or conduit 36 of Pfister as containing port 106, which is insulated to prevent the loss or gain of heat, citing Figure 4 and column 13, lines 12–20 of Pfister as support for this characterization.

However, at column 13, lines 12–20, Pfister describes that port 106 allows sorbate to enter and exit the sorber 12.¹² Pfister describes that port 106 may include a filter 108 "to prevent the sorbent from migrating out of the sealed enclosure and into the line 36."¹³

In no way does the teaching of a filter to prevent sorbent from exiting into line 36 disclose or even remotely suggest an adiabatic section of input/output line 36. For at least this reason, Pfister fails to disclose or suggest that the first and second passages comprise adiabatic sections, as required by Applicant's claim 3.

Pfister fails to disclose or suggest each and every limitation set forth in claims 1–11. For at least these reasons, the Examiner has failed to establish a *prima facie* case for anticipation of Applicant's claims 1 – 10 under 35 U.S.C. 102(b) or nonpatentability of Applicant's claim 11 under 35 U.S.C. 103(a). Withdrawal of these rejections is respectfully requested.

¹² Pfister, column 13, lines 14–17.

¹³ Pfister, column 13, lines 19–20.

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CONCLUSION

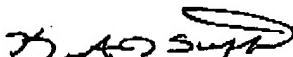
All claims in this application are in condition for allowance. Applicant respectfully requests reconsideration and prompt allowance of all pending claims. Please charge any additional fees or credit any overpayment to deposit account number 50-1778. The Examiner is invited to telephone the below-signed attorney to discuss this application.

Date:

June 18, 2008

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